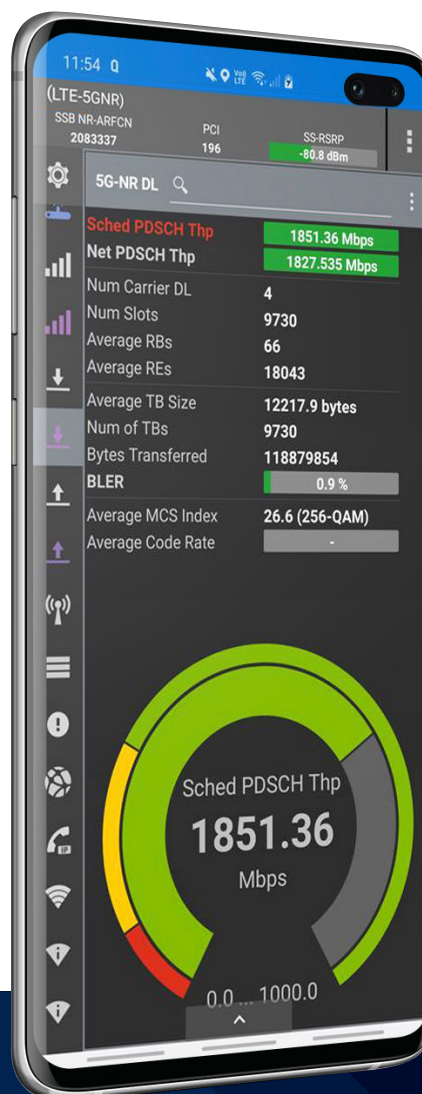


QUALIPOC ANDROID

The premier handheld troubleshooter



Product Brochure
Version 05.00

ROHDE & SCHWARZ

Make ideas real





More than half of today's voice and data traffic is generated in indoor environments such as offices, shopping malls, airports, subways and event venues. Such challenging locations require adequate portable mobile network testing solutions.

That is why Rohde&Schwarz mobile network testing (MNT) invented QualiPoc Android, a multifunctional smartphone based tool for troubleshooting voice and data service quality and RF optimization. As the premier handheld troubleshooter, QualiPoc Android sets a new industry standard for smartphone based mobile network testing.

QualiPoc is based on the latest commercial Android smartphones. It supports all mobile network technologies used worldwide and covers multiple protocol layers as well as the IP stack in real time. QualiPoc Android provides extensive test functions for voice (including MOS), data, video streaming and app service tests to assess and reflect the real end-user experience (QoS/QoE) within a mobile network.

QualiPoc offers an intuitive, fully customizable user interface. Multiple standard and configurable monitors and graphs can be selected to display measurements, parameters (KPIs) and test results in real time, including the full history. It also records and saves information in a measurement file for replay or detailed analysis with Rohde&Schwarz MNT's postprocessing software.

The multifunctional QualiPoc Android is a cost-efficient and powerful pocket solution for every RF engineer who performs daily tasks such as site verification and commissioning, troubleshooting and RF optimization.

KEY USE CASE

Ad hoc voice and data service quality testing and verification

Use QualiPoc Android, for example, for multiple integration tests when a new site installation is planned. An RF engineer can perform several data traffic tests with QualiPoc in order to verify the quality level of services. Each cell sector and all carrier frequencies are tested using the advanced forcing functions on its handheld optimizer. With the detailed results displayed on the monitors, the technician can immediately optimize the site or trigger additional improvement actions.

On the way back to the office, for example, a quick measurement campaign in a shopping mall is requested. By taking a picture of the building's floor plan with the built-in camera and using it for the requested indoor testing, the technician can immediately start an indoor campaign. Commuting back on a crowded train in the evening, the technician can then use his QualiPoc smartphone for a quick network performance check – all information and data is stored in a measurement file ready for detailed analysis the next day.

At a glance

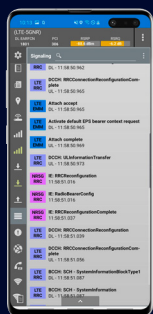
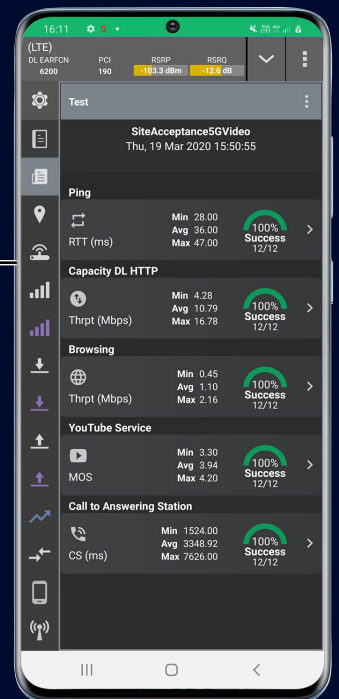
- ▶ Smartphone based RF optimization and service quality assessment application, supported on a wide range of the latest Android smartphones and tablets
- ▶ Comprehensive range of service test functions for voice, data and video as well as for channel and cell locking for dedicated RF optimization
- ▶ Intuitive user interface, including customizable monitors and workspaces

History popup

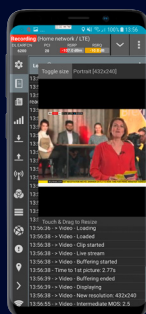
For number based values, a chart of the last 60 seconds is shown; for all other values, a list of the last 20 changes is visible.



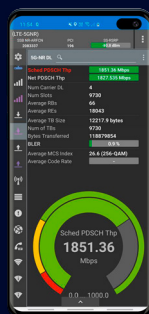
Tapping on the KPI indicator shows the history



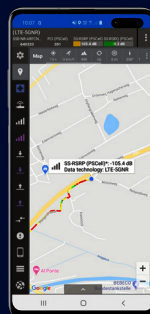
Layer 3
messaging



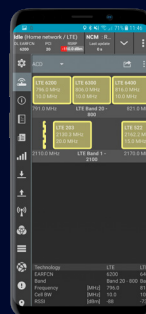
Video
testing



Technology cell
information



Map
monitor



Scanner control and
result view

Test result monitor showing success rate
and test KPIs

QUALIPOC ANDROID

ALWAYS AT HAND
WHEN YOU NEED IT



PRODUCT HIGHLIGHTS

VOICE AND VIDEO QUALITY TESTS ON A HANDHELD DEVICE

Measuring subjective service quality is a challenging task that requires expertise and specialized knowledge. Rohde&Schwarz MNT has been working in this area for more than a decade and has developed three major algorithms for detailed analysis of subjective quality, including two new ITU-T standards for HD video and HD audio quality assessment.

QualiPoc Android offers a comprehensive set of RF optimization features and the full range of audio quality assessment tools.

Voice quality testing algorithms, such as P.863 (POLQA) and SQuad, allow users to easily evaluate quality of services on voice calls in line with the latest ITU-T standards, including HD audio quality. Having not only the MOS for audio quality but also the RF parameters and application layer information available from a single handheld device, QualiPoc Android provides all important information that is crucial for troubleshooting and optimization.

QualiPoc Android offers three different audio quality algorithms (POLQA, PESQ and SQuad08) and supports multiple audio voice quality tests such as mobile-to-land unit and mobile-to-mobile in both directions UL/DL.

For video quality, Rohde&Schwarz MNT supports the J.343.1 hybrid no-reference encrypted (NRe) objective perceptual video quality measurement algorithm. It is designed for multimedia IP based video services when encrypted bitstream data is available, e.g. YouTube video streaming. The J.343.1 no-reference algorithm is especially designed for measuring video quality on live video content consumed by smartphones.

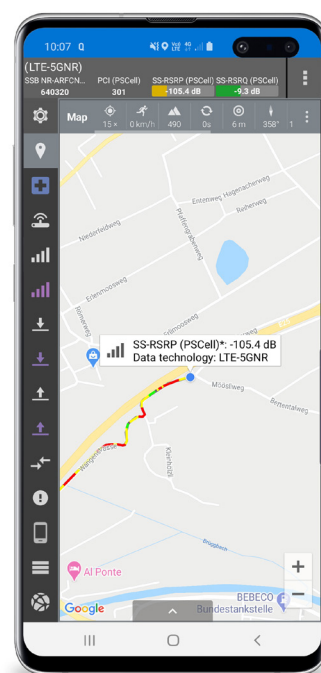
ENHANCED MAP MONITOR

The enhanced map monitor offers comprehensive and valuable benefits to simplify indoor measurements. It combines outdoor and indoor navigation on one monitor. QualiPoc's map monitor offers, for example, integration of geo-referenced floor plans, which reduces the complexity of combined outdoor and indoor measurements in locations such as shopping malls, airports or similar locations.

It supports import and export of iBwave files with multifloor plan navigation as well as loading of predefined GPX tracks to navigate an operator to a specific location. This exclusive QualiPoc feature helps reduce errors and improve operational efficiency for indoor and outdoor measurements.

The map monitor also displays line to cell based on information from the base station location files for 5G NR, LTE and all other technologies.

For route tracking, users can select from 250 RF parameters or KPIs.



Map monitor showing SS-RSRP, one of 250 RF parameters that can be selected for route tracking.

KEY PRODUCT FEATURES

REFLECTING THE REAL END-USER PERCEPTION

Ever since its launch, the QualiPoc application from Rohde&Schwarz MNT has been supported on a wide range of Android smartphones and tablets, including the latest models from Samsung, LG, OnePlus and Sony. New Android smartphone models are continuously integrated into the QualiPoc platform, which enables Rohde&Schwarz MNT customers to assess a mobile network's performance and competitive situation. Always based on the latest end-user devices, it ensures a true representation of customer perception of services.

COMPREHENSIVE FEATURE SET ON A HANDHELD DEVICE

Extensive set of service tests

QualiPoc Android provides an extensive set of service tests. These include call tests, voice quality (including POLQA, PESQ and SQuad08) as well as data tests, video streaming and video quality. QualiPoc covers all test functions and latest technologies such as:

- ▶ 5G NR, LTE-FDD&TD-LTE, HSDPA, HSUPA, HSDPA DC, WCDMA, EDGE, GPRS, GSM, CDMA2000®, EVDO Rev. 0/A
- ▶ Full recording and decoding of protocol layers on the supported technologies: 3GPP, L2, L3, TCP/IP, IMS, SIP Rev. 0/A.
- ▶ Direct decoding of L3 text messages and TCP/IP, RTP packets on smartphones.

Ready for new and evolving applications in 5G networks

5G will enable a new set of services, not only for human users but also for industrial and automotive purposes. Key factors for acceptance and use are ultra-high reliability and real-time interaction capability.

For those future applications, it is key to measure and rate the interactivity of a network and to efficiently identify transmission bottlenecks.

QualiPoc Android offers its new interactivity test to measure exactly these new key parameters. The interactivity test combines testing of round trip latency, packet delay variation, packet error rate and proofing bit rate in one single test.

On-device report

As an option, users can enable the on-device reporting on QualiPoc Android. This feature creates a PDF report directly on the smartphone at the end of each job. This is very convenient, especially for single site verification, but also to see what has been tested previously on that QualiPoc.

Advanced RF optimization feature

QualiPoc Android offers advanced channel and cell locking, a crucial RF optimization feature to control the quality and coverage of wireless networks. This enables mobile operators and testing service providers to implement fast and cost-efficient on-site inspections, and it allows them to test and verify the antenna range by conducting active service and performance tests, including speech quality measurement for each cell sector at an antenna site.

OTA application update

With an over-the-air (OTA) update function, users can conveniently keep their QualiPoc applications up to date.

As easy to use as a smartphone

Rohde&Schwarz MNT's powerful handheld troubleshooter QualiPoc Android is well-known and highly appreciated for its ease of use and multifunctionality. The intuitive and customizable user interface is based on the latest features of today's smartphone technology with user-friendly, multitouch screen operation. All major functions, such as system configuration and test creation and execution, are always at your fingertips.

Multiple default technology and KPI monitors can be selected from a library, or a personal monitor can easily be customized based on a selection of more than 300 parameters from layer 3, device information and test KPIs. And a special import/export feature allows you to directly exchange test configuration files between different QualiPoc Android devices.

KEY BENEFITS

Using QualiPoc Android will reward you with long-term benefits, including:

- ▶ Operational efficiency of field engineers thanks to a compact, easy-to-use, multifunctional pocket tool for ad hoc measurements, troubleshooting, testing and verification. QualiPoc can also be used as a conventional smartphone.
- ▶ Up-to-date QoS/QoE testing features, including voice, data, video and messaging, and full compliance with latest industry standard KPIs.



SOFTWARE SPECIFICATIONS

Software specifications

Technologies	Extensive technology test support, including 5G NR, LTE-FDD&TD-LTE, HSDPA, HSUPA, HSDPA DC, WCDMA, EDGE, GPRS, GSM, CDMA2000®, EVDO Rev. 0/A
Devices	Support of a wide range of the latest Android flagship smartphones (Qualcomm, Samsung Exynos Shannon and HiSilicon chipsets), including Samsung Galaxy S20 5G, Note 10+ 5G, S10 5G, Samsung A90 5G, Samsung Galaxy S10, OnePlus 7 Pro 5G, OnePlus 7, LG V50 ThinQ 5G, Sony XZ3, HUAWEI Mate 20X 5G and many more
System architecture	QualiPoc software application running on Android OS devices, tracing and displaying information in real time; recording of all data to files for later postprocessing analysis
Protocol layers	Full logging and decoding of multiple protocol layers on all technologies: 3GPP, L2, L3, TCP/IP, IMS, SIP Rev. 0/A; text decoding of L3 messages, TCP/IP and RTP packets
User interface	Intuitive and fully touchscreen adapted user interface with predefined workspaces and monitors that automatically adapt to the used technology with a choice between a light or dark theme; map navigation monitor available based on Google Maps, OpenStreetMap or other tile provider with optional BTS position display; easy in-building positioning using dynamic indoor floor plan pictures or iBwave design multifloor .ibwc project files
Optimization testing	Easy configuration of standard voice and data testing tasks; static forcing of technology as well as channel and cell locking, BTS list with cell name identification; customizable notification for L3 messages and L1 values
Service testing options	<p>Benchmarking and service testing with a wide range of services:</p> <ul style="list-style-type: none"> ▶ Voice telephony: call to any number, speech MOS, audio delay ▶ Data: ping, FTP DL/UL, HTTP DL/UL, capacity DL/UL (FTP and HTTP), iPerf3 (TCP, UDP), trace route (TCP, UDP, ICMP) ▶ Browsing: HTTP ▶ Messaging: SMS (incl. RCS), MMS, email (SMTP, POP3, IMAP) ▶ Video streaming, including video MOS using ITU J.343.1 ▶ App service tests: Dropbox, Facebook, Ookla speed test, LINE (IM), WhatsApp (IM, VoIP), Instagram, Twitter
Speech quality (MOS)	<p>Speech quality testing diversity PSTN/ISDN voice call server or QualiPoc Android answering stations; standard algorithms integrated for intrusive voice MOS assessments on narrowband and wideband channels:</p> <ul style="list-style-type: none"> ▶ ITU-T P.863 (POLQA) ▶ ITU-T P.862 (PESQ) ▶ SQuad
VoLTE	Speech quality using POLQA along with many VoLTE specific KPIs are supported on VoLTE capable devices
Video quality (VMOS)	Video quality testing for multimedia IP based video services (e.g. YouTube, DirecTVnow, Netflix, Facebook Watch) in the presence of encrypted bitstream data using the J.343.1 algorithm
Positioning	For exact positioning, QualiPoc supports internal GPS or external Bluetooth® GPS for outdoor campaigns and indoor mapping (incl. iBwave) for indoor testing
OTA application update	Application update over the air; QualiPoc Android keeps you easily up to date; users can update not only the QualiPoc application but also all supported app versions used for application service tests
KPI analysis	More than 250 key performance indicators (incl. ETSI) available in real time as well as in postprocessing
On-device reporting	QualiPoc offers an optional PDF report on the device created after each finished campaign
Postprocessing platform	SmartAnalytics with in-depth data analysis, network troubleshooting, report generation and historical performance trending; flexible and customizable data selection and filtering capabilities, including time and data, network technology, operator, device type, map polygon regions, service quality threshold, layer 3 messages and more; customizable Excel reports based on KPIs with a powerful report generator
Postprocessing compatibility	Compatibility with major third-party postprocessing vendors; CSV file export option and direct result sharing to iBwave mobile app

OpenStreetMap (OSM)

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KEY TECHNOLOGY FEATURES

Key technology features

5G NR	Predefined 5G NR monitor and charts	<ul style="list-style-type: none"> ▶ Serving and neighbor cells ▶ Serving cell band, NR-ARFCN, PCI ▶ SS-RSRP, SS-RSRQ, SS-SINR ▶ Number of PDSCH carriers ▶ 5G NR access information ▶ UE capabilities and more
LTE/LTE-A	Predefined LTE monitors and charts	<ul style="list-style-type: none"> ▶ Serving and neighbor cells presentation ▶ Serving cell EARFCN, PhyCell Id, bandwidth and number of TX antennas ▶ EMM PLMN ID, EMM registration state ▶ RSSI, RSRP and RSRQ ▶ Cell parameters such as QrxlevMin, Pmax, MaxTxPower, SRxLev and more
WCDMA/HSDPA/HSUPA	Predefined WCDMA monitors and charts	<ul style="list-style-type: none"> ▶ MCC-MNC-LAC-CI, channel information, DL frequency channel number, RRC state, channel measurements and more ▶ Predefined HSDPA monitors ▶ UE category, dual carrier operation, CQI, HS SCCH decoding with QPSK, 16QAM rates and more ▶ Predefined HSUPA monitors ▶ E-DCH channel configuration, RLS set presentation, E-DPDCH happy rate, DTX rate and more
CDMA/EV-DO	Predefined CDMA2000® 1x, EV-DO Rev. 0 and EV-DO Rev. A monitors and charts	<ul style="list-style-type: none"> ▶ Active, candidate and neighbor set, CDMA2000® and EV-DO power control, CDMA cell and air link parameters and more
GSM/GPRS/EDGE	Predefined GSM monitors and charts	<ul style="list-style-type: none"> ▶ SC cell ID and band, dedicated channel information, SC C1/C2 ▶ Channel type, hopping channel information and more ▶ Predefined GPRS and EDGE monitors ▶ GMM and SM state, IP address, APN ▶ Mode, modulation UL/DL, coding scheme UL/DL and more
Network displays for RF optimization	Predefined and configurable monitors and charts	<ul style="list-style-type: none"> ▶ Cell information ▶ BTS name display ▶ Neighbor cell list ▶ Radio channel information ▶ Packet data performance and status ▶ Coverage charts ▶ Real-time statistics ▶ L3 message decoding ▶ IP trace decoding ▶ RAT technology information
VoLTE	Predefined VoLTE monitors and charts	<ul style="list-style-type: none"> ▶ RTP jitter, IPDV, PDV, JBO length, SSRC, etc.
Wi-Fi	Predefined Wi-Fi monitor	<ul style="list-style-type: none"> ▶ SSID, BSSID, RSSI, IP address, frequency, link speed, connection status, capabilities vendor and channel number

Service at Rohde & Schwarz
You're in great hands

- ▶ Worldwide
- ▶ Local and personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

Rohde & Schwarz

The Rohde & Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test & measurement, technology systems and networks & cybersecurity. Founded more than 85 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

Mobile network testing

The company's broad and diverse product portfolio for mobile network testing addresses every test scenario in the network lifecycle – from base station installation to network acceptance and network benchmarking, from optimization and troubleshooting to interference hunting and spectrum analysis, from IP application awareness to QoS and QoE of voice, data, video and app based services.

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